REMARKS

Present Status of the Application

The Office Action rejected Claims 1-17 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP06-212451.

The Office Action rejected Claims 1-17 under 35 U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP06-198466.

The Office Action rejected Claims 5 and 9-12 under 35 U.S.C. 103(a) as being unpatentable over either of JP06-212451 and JP06-198466, and further in view of JP02-085350 or in view of US2002/0001779 to Hidaka et al..

The Office Action rejected Claims 6 and 13 under 35 U.S.C. 103(a) as being unpatentable over either of JP06-212451 and JP06-198466, and further in view of US6,031,201 to Amako et al.

The Office Action rejected Claims 5 and 9-12 under 35 U.S.C. 103(a) as being unpatentable over either of JP06-212451 and JP06-198466, and further in view of US2002/0001779 to Hidaka et al or in view of US5,812,629 to Clauser.

Applicants respectfully traverse the rejections addressed to claims 1-7 and 9-17 for at least the reasons set forth below.

Discussion of the claim rejection under 35 U.S.C. 102(b) & 103(a)

1. Regarding Claim 1:

1.1 References Analysis:

1.1.1 [Clauser (US5,812,629)]

Clauser (US5,812,629) discloses an ultrahigh resolution interferometric x-ray imaging. It can image objects having negligible x-ray absorption contrast e.g. otherwise x-ray transparent low-Z artifacts such as human soft-tissue, by obtaining edge-enhanced contrast from an object's x-ray refractive-index gradients. It tried effort in **improving optical interference pattern's fringe visibility.** It operates via the fractional Talbot effect using two pre-object microfabricated gratings (G1, G2) and a detector (D) preferably containing a periodic pixel array. It further includes an in-situ laser interferometer for aligning the gratings (G1, G2) to the detector (D).

Clauser doesn't disclose the feature "irradiating a uniaxial laser beam near an ablation threshold to a surface of a material" of the present invention.

Clauser doesn't disclose the feature "executing an overlapped scanning on the irradiated region, so as to cause an ablation at a section where interference has taken place between an incident beam and a surface scattered wave generated along the material surface, and to thereby cause spontaneous formation of a periodic structure " of the present invention.

1.1.2 [Amako (US6,031,201)]

Amako (US6,031,201) discloses a laser machining apparatus with rotatable phase grating. The apparatus includes a plurality of pulse laser generators and other elements.

Amako mentioned nothing about interference fringe. Referring to column 20 line 42-48 and column 22 lines 35-43, Amako tried effort in **NO interference occurring** between neighboring beam spots.

1.1.3 [Hidaka (US2002/0001779)]

Hidaka (US2002/0001779) discloses a method for performing photolithography for generating a photoresist pattern on top of an object that includes a layer of material that is opaque to light of a predetermined wavelength.

Hidaka mentioned nothing about interference fringe and is just a background art in the related field.

1.1.4 [JP06-212451]

JP06-212451 discloses a method for ornamenting metallic surface. The surface of the metallic material M is irradiated with the laser beam L to cause interference on its surface, by which the fine ruggedness G corresponding to the interference fringes is formed. The surface having this fine ruggedness G is thereafter heat-treated in a reactive gas, by which the thin film P consisting of the reaction product of the metallic component and the above- mentioned gaseous component is formed. The patterns such as pictures

and characters on ornaments are visibly observed as reflected gloss of beautiful rainbow color development on the surface color different from the ground color as a background.

JP06-212451 forms an interference fringe on a metal surface by radiating leaser beam. Referring to paragraphs 0015-0017 of JP06-212451, it discloses that the metal surface that has been heat-treated reacts with the reactive gas **to form a film as a wave-guide path**. **When a laser pulse radiates on the wave-guide path, an interference fringe is formed** on the metal surface to ablate a micro-uneven on the metal surface.

JP06-212451 doesn't disclose the feature "irradiating a uniaxial laser beam near an ablation threshold to a surface of a material" of the present invention.

JP06-212451 doesn't disclose the feature "executing an overlapped scanning on the irradiated region, so as to cause an ablation at a section where interference has taken place between an incident beam and a surface scattered wave generated along the material surface, and to thereby cause spontaneous formation of a periodic structure " of the present invention.

1.1.5 [JP06-198466]

JP06-198466 discloses a color development processing method. The surface of a work piece W consisting of a metallic material is irradiated with the convergent pulse laser beam L in reactive gas in such a manner that pulses are cast many times to the same position. As a result, the thin film P consisting of the reaction product of the metallic components of the work piece W and gaseous components is formed on the surface of the

work piece W in the fore stage of this irradiation and the laser beam La propagating in the plane direction with the thin film P as a waveguide and the laser beam L for irradiation are interfered in the post stage of the irradiation, by which the fine ruggedness G corresponding to the intensity distribution of the interference fringes is formed on the surface of the work piece W.

Referring to paragraphs 007 of JP06-198466, it discloses that the metal surface that has been heat-treated reacts with the reactive gas **to form a film as a wave-guide path**. **When a laser beam L and laser beam La transferred through the wave-guide path, an interference fringe is formed** on the metal surface to ablate a micro-uneven on the metal surface.

JP06-198466 doesn't disclose the feature "irradiating a uniaxial laser beam near an ablation threshold to a surface of a material" of the present invention.

JP06-198466 doesn't disclose the feature "executing an overlapped scanning on the irradiated region, so as to cause an ablation at a section where interference has taken place between an incident beam and a surface scattered wave generated along the material surface, and to thereby cause spontaneous formation of a periodic structure " of the present invention.

1.1.6 [JP02-085350]

JP02-085350 discloses a manufacture of metallic tube for far infrared radiation. It efficiently manufacture a metallic tube for far infrared radiation by continuously forming

fine ruggedness on the whole surface of a metal strip, forming the above strip into a metallic tube having the above surface inside, and then forming an oxide film on the above rugged part.

Referring to Fig. 1 of JP02-085350, it **uses slit plate to form interference, which is different from the present invention.**

With the above reference analysis, no cited reference discloses "irradiating a uniaxial laser beam near an ablation threshold to a surface of a material" and "executing an overlapped scanning on the irradiated region, so as to cause an ablation at a section where interference has taken place between an incident beam and a surface scattered wave generated along the material surface, and to thereby cause spontaneous formation of a periodic structure".

Therefore, the feature of Claim 1 of the present invention is not disclosed or taught by any cited reference. **The rejection related to claim 1 is unreasonable and is kindly requested to withdraw**.

2. Regarding Claims 2-6:

In accordance with above, Claim 1 is non-obvious to the cited references. Thus, the dependant claims 2-6 are non-obvious to the cited references.

3. Regarding to Claim 7:

Claim 7 is currently amended by combing Claims 7 and 8.

The feature "forming a grating structure on a surface of a material, to thereby change surface characteristics of the material, wherein the step of forming the grating structure includes irradiating a laser beam near an ablation threshold to the surface of the material; and executing an overlapped scanning on the irradiated region, to thereby cause spontaneous formation of the grating structure." is not disclosed or taught by any cited reference. Therefore, the **currently amended Claim 7 is non-obvious to the cited references.**

4. Regarding to Claim 9-17:

In accordance with above, the currently amended Claim 7 is non-obvious to the cited references. Thus, the dependant claims 9-17 are non-obvious to the cited references.

CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 1-7, 9-17 of the present application are patentable. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,
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